

CLAIMS AMENDMENTS

1. (Currently Amended) A method of controlling thickness uniformity of a film deposited on a substrate in a processing chamber, said method comprising the steps of:
~~providing a substrate in a processing chamber;~~
controlling a temperature of at least two distinct locations on the substrate including (i) a perimeter area of a surface of the substrate and (ii) an inner area of the surface of the substrate that is inside the perimeter area of the surface; and
maintaining the temperature of the perimeter area of the surface of the substrate within a range between about 10°C less than the temperature of the inner area to about 20°C higher than the temperature of the inner area; and
depositing the film, wherein the film has a film thickness uniformity less than or equal to about 10%.

2. (Currently Amended) The method of claim ~~25~~ 1, wherein the temperature of the perimeter area of the surface of the substrate is controlled by a first heater element in a portion of the susceptor that is underlying the perimeter area of the substrate, and the temperature of the inner area of the surface of the substrate is controlled by a second heater element in a portion of the susceptor that is underlying the inner area, said controlling comprising maintaining the temperature of the perimeter area of the surface of the substrate within a range of about 380°C to about 410°C, while maintaining the inner area of the surface of the substrate at about 390°C.

3. (Previously Amended) The method of claim 2, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area at about 390°C while maintaining the inner area at about 390°C.

4. (Previously Amended) The method of claim 2, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area between about 390°C and about 400°C while maintaining the inner area at about 390°C.

5. (Previously Amended) The method of claim 2, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining

the temperature of the perimeter area between about 400°C and about 410°C while maintaining the inner area at about 390°C.

6. (Previously Amended) The method of claim 2, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area at about 410°C while maintaining the inner area at about 390°C.

7. (Currently Amended) The method of claim 25 1, wherein the temperature of the perimeter area of the surface of the substrate is controlled by a first heater element in a portion of the susceptor that is underlying the perimeter area of the substrate, and the temperature of the inner area of the surface of the substrate is controlled by a second heater element in a portion of the susceptor that is underlying the inner area, said controlling comprising maintaining the temperature of the perimeter area of the surface of the substrate within a range of about 350°C to about 460°C, while maintaining the inner area of the surface of the substrate within a range of about 340°C to about 450°C.

8. (Currently Amended) The method of claim 7, wherein said depositing comprises depositing a thin organosilicate film from a ~~TEOS~~ precursor comprising TEOS on the substrate.

9. (Currently Amended) The method of claim 1, wherein said depositing comprises depositing a thin organosilicate film from a ~~TEOS~~ precursor comprising TEOS on the substrate.

10. (Previously Amended) The method of claim 1, wherein said depositing is by chemical vapor deposition, physical vapor deposition, plasma enhanced chemical vapor deposition or rapid thermal processing.

11. (Original) The method of claim 1, wherein said depositing further comprises inputting TEOS, He, and Oxygen into a PECVD chamber; and applying RF energy to generate a plasma.

12. (Previously Amended) The method of claim 11, wherein said TEOS is inputted into said processing chamber at about 300 sccm, said He is inputted at about 100

sccm, said oxygen is inputted at about 5000 sccm and said RF energy is inputted at a power density of about .3 to .7 W/cm².

13. (Original) The method of claim 12, wherein said depositing is conducted for about one minute.

14-24. (Cancelled)

25. (Previously Added) The method of claim 1, wherein the film is an organosilicate film.

26. (Previously Added) The method of claim 11, wherein said TEOS is introduced into said processing chamber at a flow rate of about 700 sccm.

27. (Previously Added) The method of claim 11, wherein said He is introduced into said processing chamber at a flow rate of about 240 sccm.

28. (Previously Added) The method of claim 11, wherein said RF energy during said depositing provides a power density of about 0.3 W/cm² to about 0.7 W/cm².

29. (Previously Added) The method of claim 11, wherein said depositing is conducted for about 600 seconds to about 700 seconds.

30. (Previously Added) The method of claim 1, wherein said processing chamber is a rapid thermal processing chamber, a physical vapor deposition chamber, a plasma enhanced chemical vapor deposition chamber or a chemical vapor deposition chamber.

31. (Previously Added) The method of claim 1, wherein the substrate is glass or silicon.

32. (Previously Added) The method of claim 1, wherein the substrate has a length that is greater than 300 millimeters and a width that is greater than 300 millimeters.

33. (Previously Added) The method of claim 1, wherein the substrate has a length between 550 millimeters and 1.0 meter and a width between 650 millimeters and 1.2 meters.

34. (Previously Added) The method of claim 1, wherein the film is deposited at deposition rate of about 850 Å/minute to about 1050 Å/minute.

35. (Previously Added) The method of claim 1, wherein said processing chamber has a power density between about 0.3 W/cm^2 and about 0.7 W/cm^2 during said depositing step.

36. (Previously Added) The method of claim 1, wherein the film is deposited using gaseous materials selected from the group consisting of SiH_4 , H_2 , N_2 , NH_3 , PH_3 , CH_4 , Si_2H_6 and O_2 .

37. (Previously Added) The method of claim 1, wherein the film is metallic or silicon.

38. (Previously Added) The method of claim 1, wherein the film forms part of a dielectric layer, a semiconductor layer or a metal layer.

39. (Currently Amended) A method of controlling thickness uniformity in a thin film deposited on a substrate in a processing chamber, comprising:

~~providing a substrate in a processing chamber;~~

controlling a temperature of at least two distinct locations on the substrate including (i) a perimeter area of a surface of the substrate and (ii) an inside area of the surface of the substrate, wherein said inside area is within said perimeter area of said surface of said substrate;

maintaining the temperature of the perimeter area of the surface of the substrate at a higher temperature than the temperature of the inside area of the surface of the substrate such that a temperature difference is maintained between the temperature of the perimeter area and the temperature of the inside area; and

depositing a film on the surface of the substrate;

wherein the temperature difference is such that the film has a film thickness uniformity less than or equal to about 10%.

40. (Previously Added) The method of claim 39, wherein the temperature of the perimeter area is maintained within a predetermined temperature difference above the temperature of the inside area.

41. (Previously Added) The method of claim 40, wherein the predetermined temperature difference is between about 0°C to about 20°C .

42. (Previously Added) The method of claim 39, wherein the film is an organosilicate film.

43. (Currently Amended) The method of claim 42, wherein the temperature of the perimeter area of the surface of the substrate is controlled by a first heater element in a portion of the susceptor that is underlying the perimeter area, and the temperature of the inside area of the surface of the substrate is controlled by a second heater element in a portion of the susceptor that is underlying the inside area, said controlling comprising maintaining the temperature of the perimeter area of the surface of the substrate within a range of about 380°C to about 410°C, while maintaining the inside area of a surface of the substrate at about 390°C.

44. (Previously Added) The method of claim 43, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area at about 390°C while maintaining the inside area at about 390°C.

45. (Previously Added) The method of claim 43, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area between about 390°C and about 400°C while maintaining the inside area at about 390°C.

46. (Previously Added) The method of claim 43, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area between about 400°C and about 410°C while maintaining the inside area at about 390°C.

47. (Previously Added) The method of claim 43, wherein the organosilicate film is produced from a precursor comprising TEOS, and said controlling comprises maintaining the temperature of the perimeter area at about 410°C while maintaining the inside area at about 390°C.

48. (Currently Amended) The method of claim 42, wherein the temperature of the perimeter area of the surface of the substrate is controlled by a first heater element in a portion of the susceptor that is underlying the perimeter area of the substrate, and the temperature of the inside area of the ~~inside~~ surface of the substrate is controlled by a second

heater element in a portion of the susceptor that is underlying the inside area, said controlling comprising maintaining the temperature of the perimeter area of the surface of the substrate within a range of about 350°C to about 460°C, while maintaining the inside area of the surface of the substrate within a range of about 340°C to about 450°C.

49. (Previously Added) The method of claim 42, wherein the film is deposited at deposition rate of about 850 Å/minute to about 1050 Å/minute.

50. (Currently Amended) The method of claim 39, wherein said depositing comprises depositing a thin organosilicate film from a TEOS precursor comprising TEOS on the substrate.

51. (Previously Added) The method of claim 39, wherein depositing is by chemical vapor deposition, plasma enhanced chemical vapor deposition, physical vapor deposition or rapid thermal processing.

52. (Previously Added) The method of claim 39, wherein said depositing further comprises inputting TEOS, He, and Oxygen into a PECVD chamber; and applying RF energy to generate a plasma.

53. (Previously Added) The method of claim 52, wherein said RF energy is inputted at a power density of about 0.3 W/cm² to about 0.7 W/cm².

54. (Previously Added) The method of claim 39, wherein said processing chamber is a rapid thermal processing chamber, a physical vapor deposition chamber, a plasma enhanced chemical vapor deposition chamber or a chemical vapor deposition chamber.

55. (Previously Added) The method of claim 39, wherein the substrate is a glass substrate or a silicon substrate.

56. (Previously Added) The method of claim 39, wherein the substrate has a length that is greater than 300 millimeters and a width that is greater than 300 millimeters.

57. (Previously Added) The method of claim 39, wherein the substrate has a length between 550 millimeters and 1.0 meter and a width between 650 millimeters and 1.2 meters.

58. (Previously Added) The method of claim 39, wherein said processing chamber has a power density between about 0.3 W/cm^2 and about 0.7 W/cm^2 during said depositing step.

59. (Previously Added) The method of claim 39, wherein the film is deposited using gaseous materials selected from the group consisting of SiH_4 , H_2 , N_2 , NH_3 , PH_3 , CH_4 , Si_2H_6 and O_2 .

60. (Previously Added) The method of claim 39, wherein the film is a metallic film or a silicon film.

61. (Previously Added) The method of claim 39, wherein the film forms part of a dielectric layer, a semiconductor layer or a metal layer.